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DIVISION OF OIL, GAS AND MINING

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OK

December 2, 2002

TO: Internal File

THRU: JDS James D. Smith, Environmental Scientist III/Hydrogeology, Team Lead

FROM: PB Priscilla Burton, Environmental Scientist III/Soils

RE: Reclamation Plan – Lower Pad (Phase 2), Energy West Mining Company, Des-Bee-Dove Mine, C/015/017-AM01D-2

SUMMARY:

Phase 1 reclamation was completed in May 2002. Phase 1 involved reconstruction of three drainages in the location of the Little Dove/ Beehive pads and reshaping the water tank pad and the substation pad and access roads.

Phase 2 reclamation covers 22 acres (Section 310) of (mostly) pre-SMCRA disturbance. Substitute topsoil will be reapplied to approximately 8.4 acres of reconstructed fill slopes on the bathhouse pad and in the lower main drainage and at the Deseret portal and access road to the Beehive portal.

During Phase 2, a drainage will be carved out of the Deseret Mine pad and Tipple yard and the storage yard area (where coal mine waste was recently removed, see AM01B). The Bathhouse pad will be the repository of coal mine waste and a source of cover material, including substitute topsoil. A mixture of coal mine waste and soil will also be used as fill in the main drainage. A testing plan has been proposed to ensure adequate cover over coal mine waste throughout the site, including the drainage.

An undisturbed slope west of the tipple yard will be used as a last resort to supply cover and substitute topsoil material, leaving a 1.5h:1v face.

Plans for Phase 2 reclamation have been previously reviewed by the Division in Technical Analysis documents dated January 15, 2002 and August 14, 2002. This is the third technical review dated December 13, 2002. These plans supersede those in the currently approved MRP, Volume 2 for the salvage of substitute topsoil.

TECHNICAL ANAYLSIS:

GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The Table of Contents identifies the Phase 2 Reclamation Plan as a separate booklet (binder) that is Appendix XVI of Volume 5.

However, the binder cover indicates that the submittal is Appendix XV. And, the submittal also includes a laminated title page indicating that Appendix XV is the Phase 2 Reclamation Plan. And, a page has been created for insertion into Volume 2, Part 4, Reclamation Plan to indicate that information in Appendix XV supercedes that in Volume 2, Part 4. As a result, the Division requested that the Permittee consistently identify the location of the Phase 2 information. **In response, the Permittee has indicated that Phase 2 reclamation plans will be located in Appendix XV and information currently in Appendix XV (Sediment Pond Access Road Plans and Written Text) will be relocated in a separate amendment after the approval of the Phase 2 plans.** This approach is acceptable to the Division. In fact Appendix XV could hold information on both topics as long as the Table of Contents is accurate.

The Phase 2 Plan refers frequently to Appendix XIV Phase 1 Reclamation Plan for soils information from trenching of the site during the week of December 3, 2001

Findings:

Information provided in the proposed amendment and attached cover letter, dated October 9, 2002, is adequate to meet the requirements of the Permit Application Format and Contents section of the regulations.

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

Mr. Dan Larsen, Soil Scientist, EIS Environmental & Engineering Consulting, conducted the soils investigations as a basis of forming a reclamation salvage and replacement strategy. Mr. Larsen's report is found in Appendix XIV Phase 1 Section 200, Appendix C. Appendix C is referred to in the submittal under "Reporting of Technical Data.

As reported in Appendix C of Appendix XIV Phase 1, laboratory work was performed by Intermountain Laboratories, Inc., Sheridan Wyoming.

Findings:

Information provided meets the requirements of Reporting of Technical Data section of the Regulations.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Elevation is 7,630 feet on a southeast exposure and slopes of 1½ H:1V to 2H:1V. The plant community is Utah juniper and pinyon pine. Plants within this community include Salina wildrye, western wheatgrass, and Indian ricegrass.

Soils have been described in the MRP as either

- Typic Ustochrepts (50%) which are characterized by a 35 cm thick (13 inches) sandy loam surface layer with 25% coarse fragments. Underlying this layer is a stony loam layer 100 cm thick (39 inches) with up to 50% coarse fragments

or

- Lithic Ustorthents (25%) which are characterized by rock within 50 cm or 19 inches.

Also present are small areas of Mollisols on the north and east facing slopes. In general, Mollisols are deep, well drained, with a well developed A horizon. See the General Soil Map of the Permit Area, Drawing #CE-10502-DS.

Deseret Pad and Tipple Area Soils information

Soil and Refuse sample sites are shown on Map 200-1. The following samples have been taken of the soils adjacent to the Deseret pad and represent undisturbed soil quality: SS8A, collected in 1990 and SS5 and SS10 collected in 2001. Laboratory Data Sheets for these sites are found in Appendix A of Appendix XIV Phase 1 Reclamation Plan. The 1990 soil samples were collected by Val Payne in April 1990 and analyzed by ACZ Laboratories in Steamboat Springs, CO. The 2001 samples were collected by Dennis Oakley and Chuck Semborski in March 1990 and analyzed by Inter-Mountain Laboratories in Sheridan, WY.

Sample depths were not reported for the 1990 samples and profile descriptions are not available. Information from the year 2001 indicates that samples were taken from 0 – 6 inches, 6 – 12 inches and 12 – 18 inches of the surface at each sample site. No field notes were taken and it is not known whether a lithic contact was encountered at eighteen inches.

The undisturbed soils of the Deseret Pad are represented by sample sites SS5, SS8A, and SS10 as shown on Map 200-1. Qualities of the undisturbed soils are summarized in the Deseret Pad and Tipple Area Soils Information Summary table below. The Deseret pad soils in the location of SS10 were found to have much less sand (21%) than the other sites with texture bordering on clay loam (28% clay and 51% silt). As expected, this site had the highest saturation percentage.

Disturbed soils in the Deseret pad area are described by samples SS8 and SS9. The characteristics of these sites are also summarized in the Deseret Pad and Tipple Area Soils Information Summary table below.

Refuse quality is represented by sites SS6 and site 1117. Characteristics of the refuse are summarized in the Deseret Pad and Tipple Area Soils Information Summary table below. In some instances, the refuse is unsuitably high in pH, SAR, and EC. In most instances the refuse is too sandy for use in the top four feet of the reclaimed profile. Samples were taken of refuse/soil mixtures during trenching (December 3, 2001) and this combined mix may be more useful than straight refuse.

Deseret Pad and Tipple Area Soils Information Summary

	Undisturbed (sites SS5, SS8A, SS10)	Disturbed (sites SS8 and SS9)	Refuse sites (sites SS6 and 1117)
PH	7.2 – 7.6	7.0 – 7.3	7.0 – 10.0
EC mmhos/cm	0.32 – 0.63	0.55 – 3.0	2.1 – 13.3
SAR	0.5 – 0.6	0.81 – 1.76	8.5 – 9.1
NO_3 – N ppm	0.3 – 1.9	0.78 – 10.3`	5.1 – 6.7

	Undisturbed (sites SS5, SS8A, SS10)	Disturbed (sites SS8 and SS9)	Refuse sites (sites SS6 and 1117)
P ppm	2		2.46 – 10.1
NP (t/1000t)	180 -350	314 - 421	275
AP (t/1000t)		4	1.25
Texture	sl, ls, l, cl	loam	Sandy loam
%clay			
%sand	21 - 84	35 -55	73
SP (%)	27 - 34	31 - 35	26
Coarse frag %	25 - 40	19 - 43	29 – 34%

Bathhouse pad soils information

Bathhouse pad soils are represented by sample sites SS2, SS4, #19, and #22 all taken in 2001. Site #19 is also known as DBD 3600, a composite taken from 0 – 18 inches, and site #22 is also known as DBD 3700, a composite taken from 0 – 5 feet. Undisturbed soils in the vicinity of the bathhouse pad are represented by SS1, collected in 2000, and SS6A, collected in 1990. Laboratory Data Sheets for these sites are found in Appendix A of Appendix XIV Phase 1 Reclamation Plan. The 1990 soil sample was collected by Val Payne in 1990 and analyzed by ACZ Laboratories in Steamboat Springs, CO. The 2001 samples were collected by Dennis Oakley and Chuck Semborski and analyzed by Inter-Mountain Laboratories in Sheridan, WY.

Qualities of the pad soils and adjacent, undisturbed soils are summarized in the Bathhouse Pad Soils Information Summary table below. The most significant difference between the pad soils and undisturbed sites was the SAR, percent coarse fragments, and the neutralization potential. Soils in the vicinity of site #20 or DBD3700 with high SAR can be avoided as a source of substitute topsoil.

Bathhouse Pad Soils Information Summary

	Undisturbed (sites SS1 and SS6A)	Disturbed (sites SS2, SS4, #19 and #20)
PH	7.2 – 7.4	7.0 – 7.4
EC mmhos/cm	0.71 – 3.1	0.96 – 2.4
SAR	0.3 – 0.96	0.47 – 11.7
NO_3 – N ppm	0.8 – 7.84	0.74 – 4.8
P ppm	2 – 3.28	1 – 2.48
NP (t/1000t)	277 -308	4.5 – 662
AP (t/1000t)	0 – 5.31	0 – 1.56

	Undisturbed (sites SS1 and SS6A)	Disturbed (sites SS2, SS4, #19 and #20)
TOC	(2.6%OM) 2.9 –3.6	1.5 – 5.9
Texture	SL	L - SL
%clay	9 – 16	12 – 20
%sand	54 - 63	40 - 64
SP (%)	27 - 30	23 - 29
Coarse frag %	29	24 - 40

Main access road soils information

Cut slope soils along the main access road are presented by samples SS3 (a 2001 sample) and SS5A (a 1990 sample). The qualities of the soil are shown in the table below entitled Main Access Road Soils.

Main Access Road Soils Information Summary

	Cut slope (sites SS3 and SS5A)
PH	6.8 – 7.3
EC mmhos/cm	0.67 – 2.17
SAR	0.22 – 2.17
NO_3 – N ppm	0.1 – 1.4
P ppm	0.38 - 2
NP (t/1000t)	155
AP (t/1000t)	0 – 5.62
TOC	(4.1%OM) 2.3
Texture	SL to L
%clay	14 – 16
%sand	46 - 57
SP (%)	29 - 30
Coarse frag %	14.8 – 34.5

A soil survey of the Des Bee Dove mine site by Dr. A.R. Southard, Soil Scientist, Utah State University was included as Appendix B of Appendix X1V Phase 1 Reclamation.

Findings:

The information provided meets the requirement of Environmental Resources Soils section of the Regulations.

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Removal and Storage

Trenching at various locations on the site (as required to abate N.O.V. 01-7-1-1) has provided the Permittee with information on the depth to bedrock, rock content and available soils material in the pad fills at the site. Trenching information was gathered during the week of December 3, 2001 and is presented in Appendices A and C of Chapter 2 of Appendix XIV Phase 1 Reclamation Plan.

The Deseret Mine, Tipple and Bathhouse cover about 8.4 acres, not including the reconstructed drainages. To cover the 8.4 acres with six inches of substitute topsoil will require 6,900 cubic yards (Table 4 of Section 200 Soils). Sources of substitute topsoil are outlined in Table 5 Substitute Topsoil Excavation and shown on Drawing #200-1. In total, 20,500 cu yds of substitute topsoil may result from the sources identified in Table 5. These sources are

1) Substitute topsoil transferred from Phase 1 (500 cu yds);
2) Bathhouse outslope (8,700 cu yds);
3) Bathhouse pad trenches (8,400 cu yds);
4) Undisturbed slope within the disturbed area (2,900 cu yds).

Five hundred cubic yards of substitute topsoil was transferred from the Phase 1 area to the Deseret pad in the Phase 2 area. This material is the northern most substitute topsoil pile shown on Drawing 200-1. This substitute topsoil pile has been identified with a sign.

Drawing 200-1 shows a fifty foot wide band along the length of the bathhouse pad as a source of substitute topsoil. This swath is expected to yield 8,700 cu yds from 1.02 acres, which calculates to a salvage depth of 5.5 feet from the 50 wide band. The band, as shown on Drawing 200-1 encompasses about 20 feet of the outslope and the remainder is from the pad surface, overlapping two proposed excavations. Table 5 indicates that the two excavations in the

Bathhouse pad may yield 8,400 cubic yards of soil. This estimate may be overstated by about 500 cubic yards due to the overlap.

The quality of the material within the proposed excavations is illustrated by the laboratory analyses for trenches T6, T7A, T8, T8A, see Appendix C, Chapter 2 of Appendix XIV Phase 1 of the MRP. The surface 2-3 feet of soil on the bathhouse pad outslope is the best available material in the permit area. Below this depth, the bathhouse pad material was rated only marginal by the soils consultant due to its high carbonate content, SAR, and EC. Although marginal as a surface soil, this material may be a good source of clean fill.

Using only the surface soil from the bathhouse pad as substitute topsoil, approximately 5,000 cu yds could be salvaged and stored, based upon a swath that is 900 ft x 50 ft x 3 ft deep. This surface soil, along with the 500 cu yds brought down from Phase 1 reclamation, could supply 80% of the six inch topsoil requirement for the 8.4 acres. Since this has been identified as the best available material in the permit area, the Permittee has made a commitment on page 14 of Section 200 to separately salvage and store the surface three feet of bathhouse outslope from the other subsurface colluvial material to be excavated from the bathhouse pad.

A third area proposed for substitute topsoil salvage is the undisturbed "island" below the access road and west of the bathhouse pad, represented by soil sample site SS5 (see Appendix XIV Drawing #CM-10336-DS and Appendix XIV Appendix A, Soils Analysis 2001). Disturbing 0.89 acres of this ground may yield approximately 2,900 cu yards of material, assuming half of the material is useful as soil. This calculates to three additional inches to the entire 8.4 acre disturbed area. The Division recommends that all other sources are exhausted before utilizing this area. For instance, a similar amount of topsoil may be gained from increasing the reach of substitute topsoil salvage in the vicinity of the southern portion of the bathhouse pad (post-SMCRA disturbance).

Consequently, in the second Technical Analysis of this submittal, dated August 14, 2002, the Division requested the following:

> **R645-201-232.200,** (2) The submittal must indicate the Permittee's intention to utilize the undisturbed "island" south of the Tipple yard for substitute topsoil as a last resort after other alternatives have been exhausted and after consulting with the Division and obtaining the Division's concurrence. (3) The Permittee must evaluate increasing the area of substitute topsoil salvage from the southern portion of the bathhouse outslope.

The Permittee has committed to use the materials in the "undisturbed island" as a last resort (see asterix in Table 5, of Section 230). If this area is disturbed, it is the Permittee's intention to eliminate the undisturbed island and reclaim the road cut completely (see attached cover letter dated October 9, 2002). The Division has recommended first utilizing the soils on the southern portion of the bathhouse outslope (represented by sample sites SS1 and SS2 and

Trench T6 which were rated as the best available in the permit area by the soils consultant) for use as substitute topsoil (see Appendix A of Appendix XIV Phase 1 Reclamation Plan for soils analyses).

The Permittee indicated in a telephone conversation on December 17, 2002 (conversation between Dennis Oakley and Priscilla Burton) that materials on the southern portion of the bathhouse outslope are limited due to a rock outcropping and a drainage that cuts down the slope. Mr. Oakley agreed during this conversation that the material on the bathhouse outslope should be salvaged whenever it was encountered. Further, Mr. Oakley indicated that if field changes in the reclamation work require unanticipated disturbance to the outslope, the surface soils will be salvaged and separately handled for use as substitute topsoil.

Cut slopes at cross sections –1+00, 0+00, 1+00, 2+00, 3+00, 8+00, 9+00, 10+00 and 11+00 will not receive topsoil coverage, instead the cut face will be roughened and seeded. Areas of Phase 2 that will receive topsoil coverage are shown on Drawing 200-2.

The submittal indicates on page 14, Section 200 that the excavated topsoil will be segregated and stored separately from spoil material, in a location to be chosen by the contractor as the reclamation progresses. Division recognizes the need for flexibility in handling materials, and will not require a description of topsoil storage since prompt redistribution of substitute topsoil is expected (R645-301-234.100).

However, given the approximate nature of the substitute topsoil projections and the necessity of providing adequate cover for the coal mine waste, the Permittee has made the commitment on page 12 Section 200 to keep a weekly written accounting of the volume of substitute topsoil separated and stored and the volume of topsoil redistributed. The weekly accounting will be available on-site for review by DOGM staff.

In the second Technical Analysis of this submittal, dated August 14, 2002, the Division requested the following:

> **R645-301-242.120, -242.130,** The Permittee should include in Section 500 Table 1, Procedural Steps of Reclamation Timetable instruction for the contractor to handle soils only when they are in a loose or friable condition or when the moisture content is an optimal 10 – 15%. Generally, two rules apply: a) If the soil sticks to the equipment, wait until the soil has dried to a friable state. b) If the soil is too dry and hard to handle, resembling flour, add water until the soil is wetted to a loose, friable condition.

The Permittee has included the following statement: "*materials will be handled as required by R645-301-242.100 through R645-301-242.130*" in Table 1 of Section 500. Although this statement does not make it very clear to a contractor what performance standards are to be achieved, it does comply with the requirements of the regulations. The Permittee will need to

interprete the meaning of this statement to the contractors. The Division will hold the Permittee responsible for the contractor's handling of the soil. To avoid compaction soils should not be handled when they are too dry and powdery or too wet and sticky. The optimum moisture content is between 10 – 15%.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of Operations Plan Topsoil and Subsoil section of the regulations.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Coal mine waste

Coal spills fall into the category of coal processing waste as a product of physical processing and preparation of the coal. The coal spills are required by general regulation, R645-301-542.730, to be placed in a controlled manner. Reclamation plans have more specific requirements: coal processing waste must be disposed of according to R645-301-553.260 which refers to R645-301-553.252 which requires that the coal mine waste will be covered with a minimum of four feet of the best available, nontoxic and noncombustible material. Regulation R645-301-553.510 clarifies that continuously mined areas subject to AOC provisions will comply with the requirements of R645-301-553.260. Lesser cover may be allowed if the Permittee can show that lesser cover will be adequate to prevent erosion and provide adequate soil stability.

In addition, the Division is required by R645-301-553.300 to ensure that combustible materials produced during mining will be adequately covered with nontoxic and noncombustible materials and to minimize adverse effects on plant growth.

Potential sources of cover for the coal mine waste include the soil/coal mixture found in trench T4A, native soil beneath the access road to the tipple area in trench T5 and fill beneath the main access road in trench T10, and the Bathhouse pad (see Appendix C of Appendix XIV Phase 1 of the MRP).

Clean up of all coal waste is the second reclamation step described by Table 2, page 11 of Section 500, Engineering. This process will be ongoing as the reclamation of the Deseret pad and the Tipple yard proceeds and pockets of waste and less desirable material are unearthed.

In accordance with R645-301-731.311, the application indicates that areas of minor coal spills will be removed and buried in the cuts of the access road and portal pads and in the two trenches to be excavated from the bathhouse pad (Reclamation Plan, Engineering Section 542.730). The volume of the two trenches is 8,400 cu yds. **The submittal indicates in Section 731.300 that material with a high carbon content excavated during the backfill and grading process will also be buried in the trenches and/or used to develop pad slopes.** The submittal indicates in Sections 240 and 553.100 that excess yardage will be hauled from the Deseret pad and Tipple pads to the Bathhouse pad or to the waste rock site for disposal.

In accordance with R645-301-542.730, the application indicates there will be a net cut from the Deseret and Tipple pads of approximately 91,382 cu yds (Section 553.100). This will be partially offset by the requirement for 64,600 cu yds of net fill at the bathhouse pad. There is a requirement for 58,000 cu yds of fill in the main drainage between cross section 3 + 00 and 8 + 00 (based on the cross-sections of Drawing 500-4). The application does not clearly indicate the source of the fill in the drainage, but the Division assumes from the figures that the source of fill will be from the Tipple yard. Mr. Oakley confirmed this assumption during a conversation with Priscilla Burton on August 13, 2002. Mr. Oakley indicated that spoil and coal mine waste from the Tipple area would be pushed down to fill the low spot in the drainage, compacted, and covered with clean fill from the side slopes.

The information provided in section R645-301-731.300 Acid and Toxic-Forming Materials states that "Material with a high carbon content excavated during the backfill and grading process will be hauled to the bathhouse pad buried in the excavated soil trenches or used to develop pad slopes." To solve the recurring issue of adequate cover over the coal mine waste and of avoiding placement of coal mine waste in the drainage, the Permittee has provided a commitment to sample the main drainage and the bathhouse pad as written in the "Substitute Topsoil Distribution" portion (page 14) of Section 230. Sampling the surface four feet of soils for acid/toxic characteristics and suitability for plant growth will ensure that the requirements of R645-301-553.260, -553.252, are met.

The Permittee indicates on page 14 of Section 200 their intention to sample the near surface waste materials in the bathhouse area for the parameters outlined in the Division's 1988 Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. The plan for sampling the near surface waste was further explained by Dennis Oakley in a telephone conversation with Priscilla Burton on December 17, 2002 as follows: Four separate samples will be taken randomly across the bathhouse pad. Each sample will be a composite of the material in the 0 – 4 foot depth. Four separate samples will be sent for analysis to evaluate the parameters as listed in Table 2 of the Division's 1988 Guidelines.

The Division is in agreement that a mixture of soil/coal is far more productive than coal alone. A clean fill depth of 3.5 feet mixed coal/soil plus six inches of topsoil will provide adequate cover after the pocking procedure (described in Section 350, Performance Standards) to ensure that adverse effects on plant growth are minimized (R645-301-553.300).

The reclamation plan does not describe a method to measure the depth of topsoil and mixed soil/coal fill over all coal processing waste and underground development waste. In a telephone conversation between Dennis Oakley and Priscilla Burton on December 17, 2002, the Permittee agreed to utilize stakes to ensure this depth of cover.

Findings:

Information provided in the proposed amendment is adequate to meet the Spoil and Waste Materials requirements of the Regulations.

RECLAMATION PLAN

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

General

During During a discussion held at the Energy West offices on December 18, 2001 between Division personnel (Priscilla Burton, Pete Hess, Dana Dean, Susan White, Pam Grubaugh Littig and Jim Smith); Brian McClelland, Geologist with the U.S. Forest Service; and Energy West Mining Co representatives (Dennis Oakley and Chuck Semborski), Division personnel inquired as to the location of slopes that would be steeper than 2h:1v, as these steeper slopes will not receive topsoil treatments.

The submittal indicates that all **fill** slopes will be graded to 2h:1v. **Slopes formed by cuts may be steeper.** Areas of topsoil placement are shown on Drawing 200-2. **The Division has noted that there are cut slopes at cross sections –1+00, 0+00, 1+00, 2+00, 3+00, 8+00, 9+00, 10+00 and 11+00. These cut slopes will be roughened and seeded, no substitute topsoil will be applied to the cut slopes.**

During a discussion held at the Energy West offices on December 18, 2001 between Division personnel (Priscilla Burton, Pete Hess, Dana Dean, Susan White, Pam Grubaugh Littig and Jim Smith); Brian McClelland, Geologist with the U.S. Forest Service; and Energy West Mining Co representatives (Dennis Oakley and Chuck Semborski), Division personnel inquired after the fill sources that would be used to fill the drainage in the re-mined section of the "valley fill." Mr. Semborski suggested fill sources such as the abutment at cross-section 1+00 and material under the access road at the location of the last trench.

In the Technical Analysis dated January 15, 2002, the Division requested the following:

R645-310-535, Determine the total volume of fill required to raise the level of the main drainage in the "Valley Fill" location and show sources of fill in Appendix C in Section R645-500 and on the cross-sections of Sheet 500-1 and 500-3 and 500-4.

The Permittee indicated in the cover letter (dated April 29, 2002) that there would be approximately 47,000 cu yds of fill required to establish the grade of the lower section of the main drainage. During a conversation with Dennis Oakley on August 13, 2002, the Division learned that the Permittee's intention is to push refuse down the drainage and compact it beneath fill from the cut slopes above the drainage.

In the last technical review, the Division requested that the Permittee be mindful of the requirements for cover over the waste (R645-301-553.260) and that the waste must be placed in a controlled manner to minimize adverse effects of leachate on the surface and groundwater (R645-301-746.120, -731.310, -731.311). The waste in the Tipple yard was represented by Trench T4, T5, T7, T9 and T10 (Appendix C of Chapter 2 of Appendix XIV of the MRP) and the remined coal of the storage yard is represented by samples #5, #8, #9, and #17 from the 200 Soil Sampling Program (Appendix A of Chapter 2 of Appendix XIV of the MRP). Coal/spoil mixtures analyzed in the trench sampling program have SAR values around 3.5 to 4.0, and positive Acid/Base Potential. **The trench sampling program did not include Boron or Selenium analysis, but the 2000 soil sampling program did. No elevated Boron or selenium values were noted in the four samples that were provided to the Division (out of fifteen taken from the waste).** Based on the previous sampling, the Division agreed not require sampling of the coal processing waste as it is backfilled in the drainage. But the Division did request on August 14, 2002 that the surface four feet of the drainage is sampled prior to placement of the Type II filter bedding as restated below:

R645-301-746.120, -731.310, -731.311, The plan must include a commitment to sample the surface four feet of the drainage prior to placement of the Type II filter bedding as follows: (1)The surface four feet of the drainage will be composite sampled at the location of each cross section from 3+00 through 12+00 prior to placement of filter fabric. (2)Analysis will include laboratory measurement of pH, EC, SAR, acid/base accounting, Boron, Selenium.

This arrangement was agreed to by Dennis Oakley in a meeting with the Division on August 19, 2002. And so, the statement in the cover letter that there will be no change to the reclamation plan as a result of this deficiency came as a surprise to the Division. Subsequently, the Permittee has provided an update to the submittal indicating on page 14 of Chapter 2 in Section 230 Substitute Topsoil Storage that the fill in the main drainage will be sampled at four locations to a depth of four feet to determine suitability according to the 1988 Division *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining.*

Sampling of the coal refuse to date has demonstrated that it is far less suitable for use in the rooting zone than other soils due to its texture (sand), organic carbon content (70 – 90%) and elevated SAR values.

Since the six inch substitute topsoil layer of six inches will serve as a seedbed, it is imperative that SAR values are kept low, less than 2.0. Low SAR values will also increase resistance to erosion (lower K factor).

Findings:

Information provided in the proposed amendment is adequate to meet the Reclamation Backfilling and Grading requirements of the Regulations.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

During the Technical Review dated January 15, 2001, the following deficiency was written:

> **R645-301-233,** Please provide information from the trenching activity conducted during the week of December 3, 2001 and utilize the information to present a coherent plan for substitute topsoil salvage and redistribution.

The submittal indicates on page 14, Section 200 that the excavated topsoil will be segregated and stored separately from spoil material, in a location to be chosen by the contractor as the reclamation progresses. Sources of cover material have been discussed in the Operations Topsoil/Subsoil section of this technical review. Drawing #200-2 identifies substitute topsoil placement.

Phase 2 reclamation covers 22 acres (Section 310). The area of cut and fill activity is 8.4 acres as outlined in the submittal Section 553.100:

- Deseret Mine portal pad/material storage (1.1 acres)
- Bathhouse pad (2.0 acres),
- Tipple pads (3.4 acres),
- ancillary access roads (0.76 acres)
- access road from the mine site to the cattle guard (4.3 acres).

This leaves10.44 acres out of the 22 acres total area that by default must fall within the reconstructed main drainage.

Drawing #200-2 shows substitute topsoil will be redistributed over 5.25 acres of reconstructed fill slopes on the bathhouse pad and in the lower main drainage and at the Deseret portal and access road to the Beehive. Another 3.16 acres of cut slope area may receive substitute topsoil depending upon the rock outcrop and "native ground" exposed.

Redistribution

Deseret Portal Area

The Deseret Portal area is approximately 1.1 acres. The Deseret Portal area will be graded utilizing in place material. Six inches of substitute topsoil will be applied to the surface and the soil will be pocked to a depth of 18 inches.

Bedrock exists at a depth of about 5 feet below the surface in the pad area. Little suitable substitute topsoil exists in this area (see field report dated December 17, 2001), although the soils consultant did comment that the soil/coal mixture found in trenches T4A would be suitable substitute topsoil.

Tipple Area

The Tipple area is approximately 3.4 acres. The Tipple area will be graded utilizing in place material. Six inches of substitute topsoil will be applied to the graded surface and the soil will be pocked to a depth of 18 inches.

A source of cover material exists beneath the access road to the tipple area in trench T5 and beneath the main access road in trench T10, see Appendix C of Appendix XIV Phase 1 of the MRP.

Bathhouse Pad Area

The Bathhouse Pad area is approximately 2.2 acres. The area will be filled using spoil and coal processing waste from the Deseret and Tipple pads. Six inches of substitute topsoil will be applied to the graded surface and the soil will be pocked to a depth of 18 inches.

Pad access road

The pad access road is an area of 0.73 acres. The area will be filled with spoil and coal processing waste from the Deseret pad and Tipple pad. No substitute topsoil will be replaced. The cover material will come from the adjacent berm and outslope.

Main access road

The main access road to be reclaimed is 4.3 acres. The area will be filled with the adjacent berm and outslope. No substitute topsoil will be replaced.

Findings:

Information provided in the submittal meets the Reclamation Plan Topsoil and Subsoil requirements of the Regulations.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

Erosion will be controlled by surface mulch, extreme gouging (Section 553.100, page 17) and rock placement (Section 553.110). These methods are more thoroughly discussed in the Reclamation Hydrology Sediment Control section of this Technical Analysis.

A deficiency written in the January 15, 2002 Technical Analysis read as follows:

R645-301-244, Please utilize information from the trenching activity conducted during the week of December 3, 2001 to calculate the K-factors for soils on the surface of the slopes.

A similar deficiency written in August 14, 2002 read as follows:

R645-301-752, The Permittee needs to do the RUSLE soil-loss calculations using the laboratory soil testing results in Exhibit B of Appendix C that include the very-fine sand fraction.

The information supplied was reviewed under the hydrology section of this TA and found to be adequate.

Findings:

Information provided in the proposed amendment is adequate to meet the Reclamation Stabilization of Surface Areas.

RECOMMENDATIONS:

The Permittee has resolved the critical issue of cover over the placement of coal mine waste. The amendment should be approved. The approval letter should acknowledge that the Permittee will eliminate the duplication of Appendix XV in the MRP with a subsequent submittal removing the current contents of Appendix XV to another location and updating the Table of Contents as needed.

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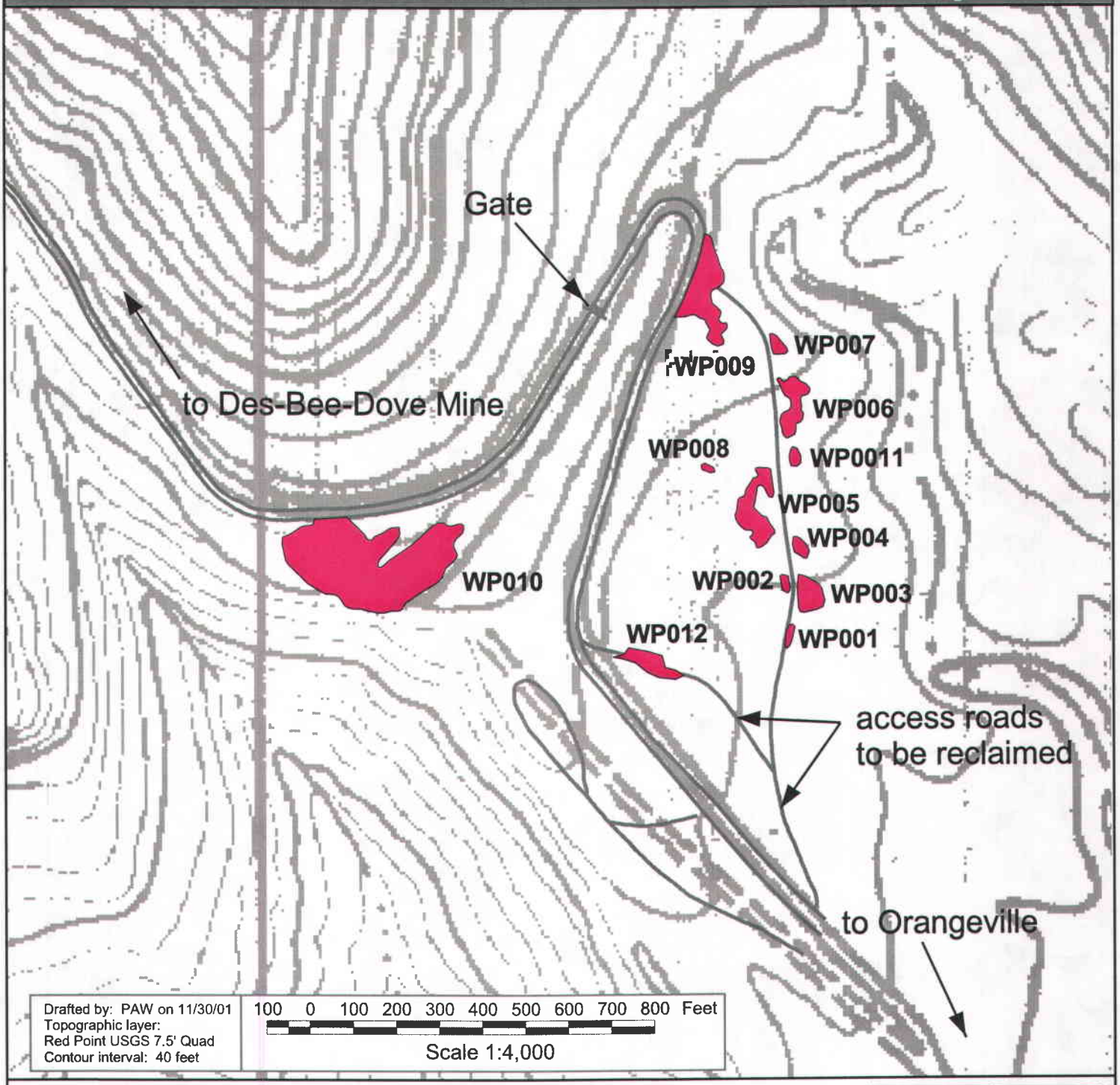
Old Johnson Reclamation Project



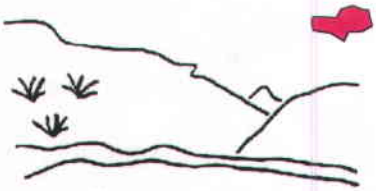
Drafted by: PAW on 11/30/01
Topographic layer:
Red Point USGS 7.5' Quad
Contour interval: 40 feet

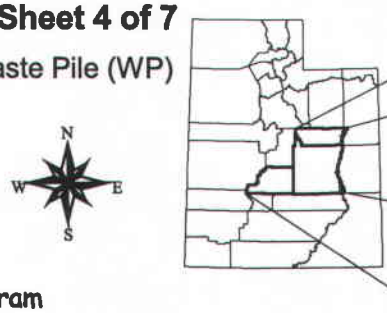
100 0 100 200 300 400 500 600 700 800 Feet

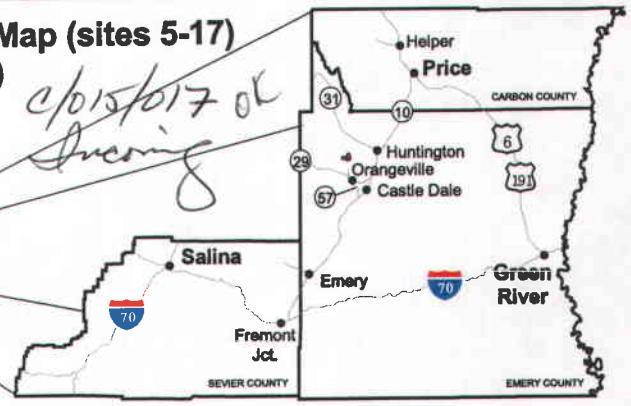
Scale 1:4,000

Des-Bee-Dove Abandoned Coal Waste Pile Location Map (sites 5-17)
Township 17 South, Range 7 East, Section 25 (SLBM)
Emery County Group, Map Sheet 4 of 7

Waste Pile (WP)







c/015/017 OK Incoming 8

Utah Oil Gas and Mining
Abandoned Mine Reclamation Program